Lignite Fuel Enhancement

Participant
Great River Energy (GRE)

Additional Team Members
Electric Power Research Institute—collaborator

Lehigh University—collaborator

Barr Engineering—collaborator

Falkirk Mining and Couteau Properties—collaborator

Location
Underwood, McLean County, North Dakota (GRE's Coal Creek Station)

Technology
High-moisture coal enhancement by incrementally drying using waste heat

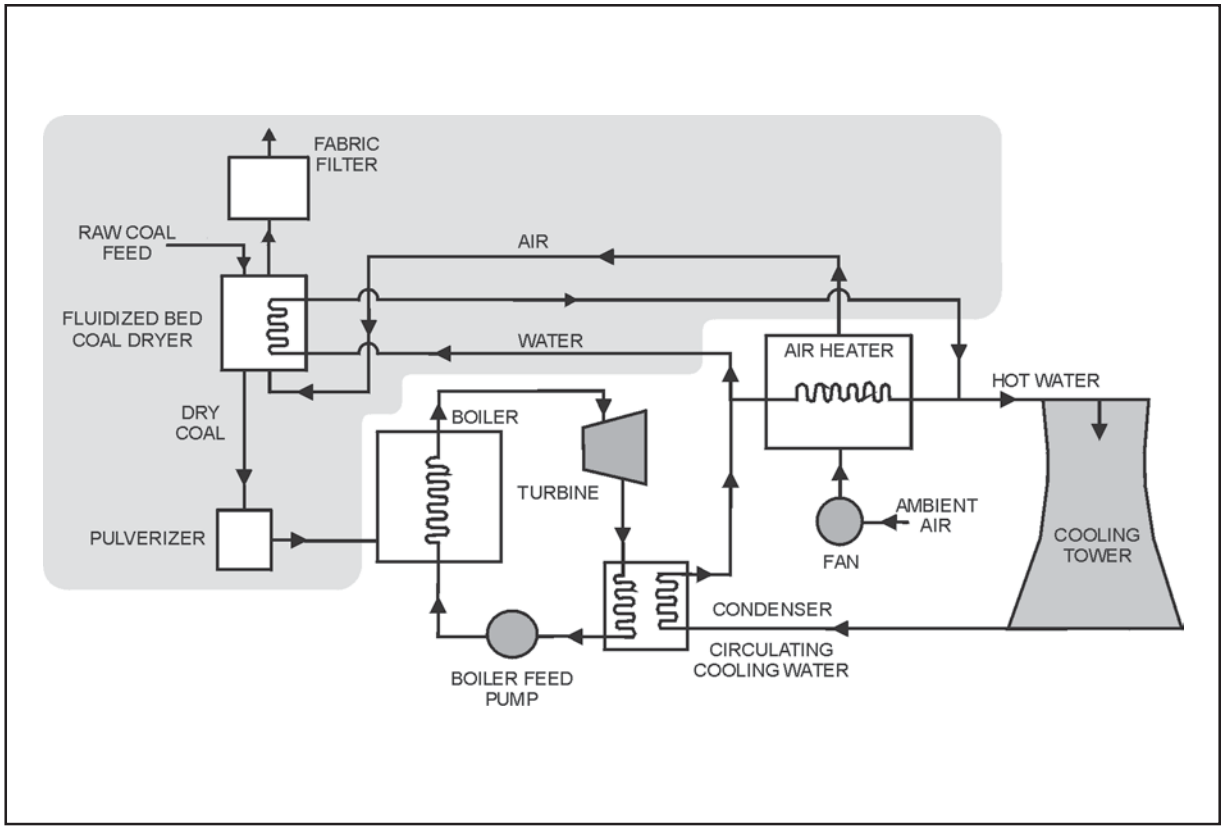
Plant Capacity/Production
546 MW

Coal
Lignite

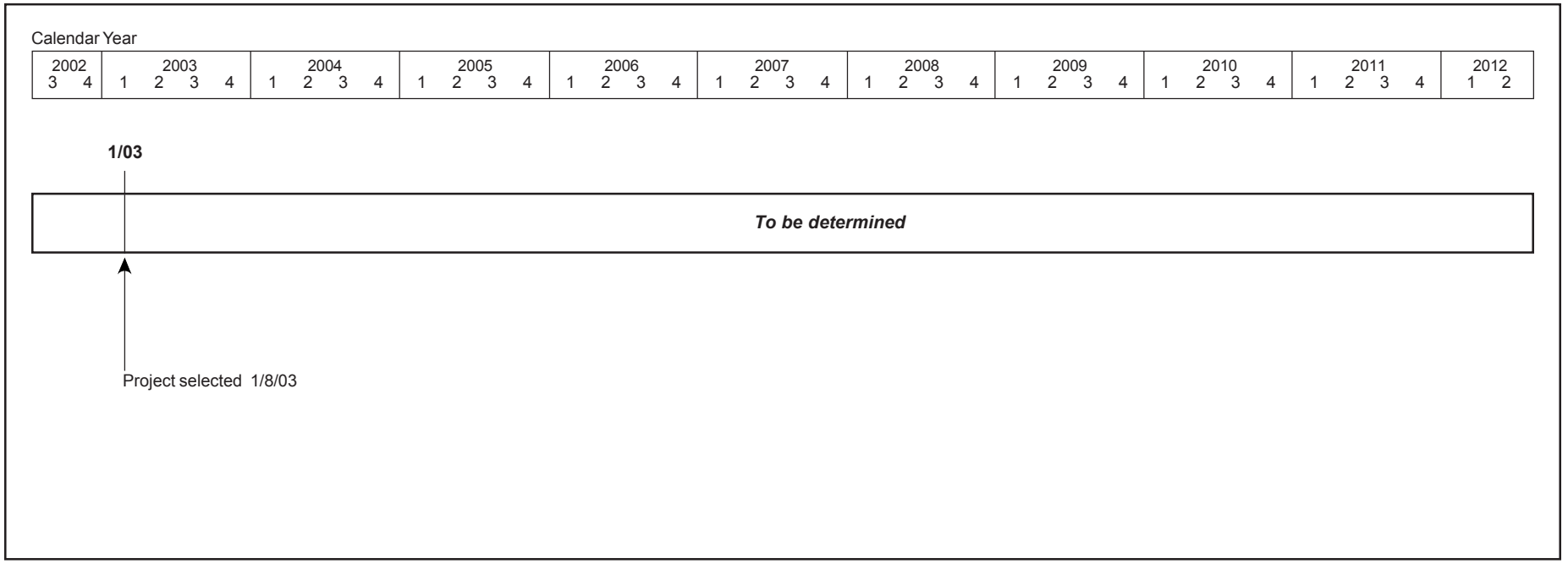
Project Funding

Total	$22,000,000	100%
DOE Share	$11,000,000	50
Participant	$11,000,000	50

Project Objective
To demonstrate a 5 to 15 percentage point reduction in lignite moisture content (about 1/4 the total moisture content) by incremental drying using waste heat from the power plant in order to significantly enhance the value of lignite as a fuel in electrical generation power plants within the next five years.



Technology/Project Description
Although current lignite power plants are designed to burn high-moisture coals, a 5 to 15 percentage point reduction in moisture content will result in significant improvements. The benefits of reduced-moisture-content lignite will be demonstrated at the GRE Coal Creek Station. A phased approach will be used. In the first phase, a full-scale prototype dryer module will be designed and built to support operation of a single pulverizer on one of the 546-MW units at the Coal Creek Station. Following successful demonstration of the dryer and the performance improvements as a result of the dryer, GRE will design, construct, and perform full-scale, long-term operational testing of a full suite of dryer modules for full operation of the unit on incrementally dried coal.



Project Status/Accomplishments

This project was selected for award on January 8, 2003. Negotiations are currently in progress. The cooperative agreement is expected to be issued in late-2003. The project duration is expected to be slightly over three years.

Commercial Applications

This project offers a novel concept for using low-value, often underutilized heat normally available in power plants, to increase the plant's efficiency, reduce pollution, and improve economics. When demonstrated, this technology could be applied to increase the generating capacity, efficiency, and cost-effectiveness of other units that burn high-moisture coal. Currently in the United States, there are 29 operating plants using lignite coal (15.3 GW) and more than 150 plants burning Powder River Basin (PRB) coals (more than 150 GW), both with inherently high moisture content. Application of this technology could result in a reduction in the emissions from coal-fired power plants because the plants will require less of the dried coal to produce the equivalent amount of power. For example, in this project, the moisture in the lignite would be lowered from 38% to 29.5% and is estimated to yield a 2.8% efficiency improvement with an attendant benefit of reducing carbon dioxide, sulfur dioxide, and mercury emissions per unit electricity output. This technology could potentially increase the efficiency of plants running on PRB and lignite which represents slightly more than half of the coal electrical generation capacity in the United States.